DOCUMENT RESUME

ED 049 795 LI 002 777

TITLE	[Symposium on Scientific Translations, 4 and 5 November 1970, Luxembourg. Selected Papers.]
INSTITUTION	European Translations Center, Delft (Netherlands).
PUB DATE	Nov 70
NOTE	33p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	*Foreign Countries, *Information Retrieval, Information Science, Languages, *Machine Translation, Reference Books, *Translation, *World Literature
IDENTIFIERS	ETC, *European Translations Center

ABSTRACT

An open meeting on scientific translation was held to mark the tenth anniversary of the founding of the European Translations Center (ETC) in Delft. The history of ETC and its activities which include collecting, translations and titles, supplying information, publication of "World Index" and "List of Translations", translation services, and cooperative endeavors in the field of terminology were described. A provisional evaluation of an experimental Russian-English Machine Translation (MT) service in cooperation with the ETC and other organizations is provided. (AB)

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ED049795

[Symposium on Scientific Translations

4 and 5 November 1970

Luxembourg.

Selected Papers]

LI 002 222

European Translations Center
101 Doelenstraat
Delft
The Netherlands

Symposium
on
Scientific Translation
4 and 5 November 1970
Luxemburg

EUROPEAN TRANSLATIONS CENTRE
1960 – 1970

EUROPEAN TRANSLATIONS CENTRE
1960 - 1970

Symposium on Scientific Translation
4 and 5 November 1970
Luxemburg

Colloque au sujet de la Traduction Scientifique
les 4 et 5 novembre 1970
Luxembourg

Congress Hall B
European Centre
Plateau Kirschberg
Luxemburg

Salle de Congrès B
Centre Européen
Plateau Kirschberg
Luxembourg

Colloquium on Scientific Translation

1970 sees the tenth anniversary of the founding of the European Translations Centre in Delft. To mark the occasion the ETC Board of Management is holding an open meeting to discuss the subject of "scientific translation".

The form of a colloquium has been chosen to enable as many parties as possible to participate, and to ensure a free discussion.

It is hoped that the conference will mark a turning point in the history of the ETC; and, in view of the universal interest and importance of the subject, we hope that the conference will support the endeavours to mould the centre into a true international forum in the field of translating, supporting the centre in taking up new tasks.

Among other things for example, there is a need to build up an intermediary translating service to be founded on the cooperation of translating units in different countries.

It seems also that the time has come to back the initiative taken by the International Federation of Translators and to build up, in conjunction with the Council of Europe, and many other organizations, a terminological centre for science and technology.

With the widening of ETC's interests it is suggested that two new categories of membership be introduced: associate and supporting membership.

The meeting is made possible by the kind cooperation of the Government of Luxemburg which is acting as host to the conference.

WEDNESDAY NOVEMBER 4th 1970 FIRST DAY

Morning

as from 8.30	Reception and Registration of Participants

CLOSED BOARD MEETING

9.00	Opening of the meeting Adoption of agenda Nomination of the Editorial Committee
9.15	Review of decisions & recommendations of the 8th Board Meeting, Hanover October 1st and 2nd 1969.
9.30	Report by the Secretary General
10.00	Financial matters a- Auditor's report for 1969 b- Treasurer's report for 1970 c- Budget for 1971 and 1972 d- Pricing Schedule
10.30	Coffee break
11.00	Rights and obligations of different categories of membership.
11.30	World Index and List of Translations
12.00	Terminology activities
12.30	Translators and Translating
12.45	Close of morning session and of first session of the Board Meeting
13.00	Luncheon

WEDNESDAY NOVEMBER 4th 1970 FIRST DAY

Afternoon	**SYMPOSIUM**
14.30	Opening of the plenary session by the Minister of Culture of Luxemburg
14.45	Address by Mme de Mamantoff (President of the European Translations Centre), on "Scientific Translation and the Rôle of the ETC".
15.30	Tea break
16.00	Discussion on the paper presented by Mme de Mamantoff
17.30	End of the afternoon session and of the first session of the plenary meeting

Evening	Continuation of the CLOSED BOARD MEETING
20.00	Opening of the meeting (2nd session)
20.05	Designation of the Secretary General
20.15	Report of the Editorial Committee
20.45	Date of the next Board Meeting
21.00	Other business
22.00	Closing of 2nd session and end of the closed Board Meeting

THURSDAY NOVEMBER 5th 1970 SECOND DAY

Morning	SYMPOSIUM
9.00	Opening and continuation of the Plenary Meeting
9.10	Dr. S. Perschke "Machine Translating: Account of the experiences at CETIS, Euratom Research Establishment Ispra"
9.45	Mr. Paul Geleff "International Reference Centre for Terminology"
10.30	Coffee break
11.00	Discussion of paper presented by Dr. S. Perschke and Mr. Paul Geleff
12.00	Decisions of the Board
12.45	Luncheon

Afternoon	Continuation of the SYMPOSIUM
14.30	Opening of the afternoon session
14.35	Dr. W. Holst "The Transfer of Information to the User"
15.10	Discussion on paper presented by Dr. W. Holst
15.30	Tea break
16.00	Other business National reports
17.00	Closing address
17.30	Cocktail Party

Colloque
au sujet de
la Traduction Scientifique
les 4 et 5 novembre 1970
Luxembourg

CENTRE EUROPEEN DES TRADUCTIONS
8 1960 – 1970

Lecture to commemorate the 10th anniversary

of the creation of the

EUROPEAN TRANSLATIONS CENTRE

Madame N. de Mamantoff

Luxemburg, 4 November 1970

SCIENTIFIC TRANSLATION AND THE ROLE OF E.T.C.

by

Madame N. de Mamantoff
President of the European Translations Centre

Why is it necessary to give our full attention to the problem of scientific translation and spend quite an amount of effort in organizing translation activity in good international cooperation? Why do we lay so much stress on reaching scientists in all parts of the world and inform them of the oppertunities available to them of getting a translation of an article in a scientific periodical they need, but can not understand without this translation?

The tenth anniversary of the European Translations Centre offers a welcome opportunity of looking back at what the centre has achieved in these past years and of offering a vision of future development as we see it.
It is important, I feel, in doing this not only to tell you of the facts and the activities as they exist to-day, but first of all to go into the philosophy that lies behind them.

Before counting the trees in our wood we should rise as a bird above it and see the wood as a whole and, still more important, see the wood as a part of the whole country.
This whole country bears the name of "information transfer".
Translation activity is an indispensable part of organizing information transfer, which is the transferral of knowledge from one person to another, from the man who knows to the man who wants to know.

Information transfer has received a great deal of attention in the past years, still not enough, perhaps never enough, but the fact that its importance nowadays is recognized by our academic and scientific organizations, by our governments and by international organizations is a big step forwards.
It is indeed an aspect of human cooperation and progress that deserves our full attention, for, if we just amass knowledge and this knowledge is not used because it does not reach the man who can do something with it, then all our efforts, all our research is worthless

I am not going to paint you a picture of what is going on in the information field as a whole. No doubt you are well acquainted with the facts that made us speak of a flood of information, or the information explosion, and that led to several well-known reports and many recommendations that should lead us to the mastering of this stream.

Sufficient to say, that, if existing information is not used, all effort in creating this information has been waisted.
Just our money thrown away.

Now, one of the obstacles that stands in the way of smooth information transfer, is the language barrier. If scientist A reports his knowledge in a language scientist B does not understand, than this knowledge remains a closed book to B.
Language is a very real barrier up to the moment that we translate A's knowledge into B's language. Then the information flows again unhindered.

We may feel very happy that the language barrier is something that can be overcome and this has been overcome already to some good extent, though still much work has to be done and indeed should continue as long as we are busy transferring knowledge between people speaking different languages.

For the present we know that all countries of the world depend very much on what their scientists and their technologists achieve. They want these achievements gained with the greatest efficiency, in other words with the greatest speed and with the least amount of duplicating effort.
If knowledge exists somewhere it should not be discovered anew, but it should be used. From the point of view of the leaders of a country, the government, translation of foreign knowledge is necessary if it can help to raise its level of knowledge necessary for maintaining its level of civilization, or of catching up with the standards of other countries.
In many cases to-day information transfer, and therefore translation of literature, is necessary to chase away poverty, hunger and disease.

But it would be quite wrong to think that the need for translation exists only in developing countries, it is as real a matter for countries with a long tradition of academic and scientific activity. Countries of the west and countries of the east, to make this distinction, are very anxious to-day to know what is going on at the other side of the border.
Indeed, the European Translations Centre started its activities as an institution for collecting and making available translations from Slavonic and other languages not understood in the Western countries. And VINITI, the Russian All Union Institute for Scientific and Technical Information, has an extensive system for following Western technological literature and translating what seems important to translate.
There is, furthermore a great interest taken in the Western countries in literature in the Japanese and Chinese languages.

It would also be wrong to think that for instance all Western countries are able to reach other's literature. French scientists loose a lot of knowledge because they cannot follow English literature and the reverse. The same applies to all other nationalities. This is further evident when you look at the collections of periodicals held in the university libraries of the various contries throughout Europe.
In most cases these collections are first of all based on their own national language and certainly not on an international basis. The necessity therefore of inter-western translations cannot be ignored.

We should furthermore consider that in the past scientists in academic circles in some countries, had had a far broader education, they had in most cases, studied also at foreign universities, and had been brought up reading and conversing in other languages.
With the enormous growth of the number of students in all countries, with the new opportunities, universities offer also to students of formally non-ruling classes, the formally normal multi-lingual basis of students and therefore of the later researchworkers and technologists was severely weakened or has even disappeared.
May-be it is even quite right for a man to say:" I know my own languages, I never will master all languages, anything I need in another language therefore should be translated for me by an expert in that language!"

It would also be wrong to think that whatever has some value will be published or translated for example into Russian or English. We know that nationalistic feelings are very strong to-day and that new countries feel a pride in developing their own academies,their own universities, their own research institutes. It is certainly not only a matter of nationalistic pride, it is in many cases a must, a matter of survival, a matter of reaching independence.
So, we must see that not every country is willing to publish in another language than its own. There is even the possibility that a country wants to publish in its own language because in this way it can keep its knowledge to itself for a certain, perhaps important, period.

We have entered herewith the sphere of national and international politics. It does not surprise us of course at all. Information control and languages by their very nature belong to that sphere.
It does not mean of course that E.T.C., the European Translations Centre, is a political institution or an instrument in the hands of some international group. It has only this meaning, that as long as national and international politics do not lead to one international community with one language, but, on the contrary leads to a great diversity of groups each one proud of its own language, and not willing to publish all acquired knowledge in one world language, the language barrier to a simple information system continues to exist and forms a reality with which we have to live.
This means that we have to translate from one language into another.

The introduction of one world language as such, or as a second to all men common language, for instance Esperanto, would undoubtedly be a solution.
E.T.C. feels that it is not her business to promote such an approach. E.T.C. just handles the multi-lingual situation as it exists.

A second approach to the problem is "language education". Furthering the mastering by all people, at least by all scientists and technologists, of more languages. Which means the establishing of language courses (private, schools, universities, radio, television, grammophone records etc.).
But it is not the rôle of E.T.C. to handle this approach.

E.T.C. solely deals with the problem of what can be done under the given situation. The scientific and technological world produces literature, describing its daily progress, in many different languages.
Therefore at the moment translation from one language into another, in many fields, in many directions is necessary and is desired by that scientific and technological world.
And E.T.C. is always ready to initiate and to promote the making of translations, "to remove barriers thus removing the language barrier" for example in collecting terms and standardizing terminology, in collecting and supplying translations, to give information on the existence and on the availability of translations and so on, in short whatever seems practical and useful.
E.T.C. does this work on a truly international basis.

From what I have said follows that our philosophy is general and practical. It has no starting point and no terminal in some special group of countries or languages. It only wishes to serve the international world of science and technology.

When I now turn to the history of E.T.C.'s birth and development what I have just said is not at all contradictory with regard to the parentship of O.E.C.D.
We are grateful for O.E.C.D.'s initiative and continued interest in E.T.C.'s wellbeing.O.E.C.D. has offered opinions but has never tried to impose its views on E.T.C., allowing E.T.C. to stand on its own feet from the very beginning.
The statutes of E.T.C. speak of " international cooperation", of "international and national institutions as participants which can contribute towards the attainment of its aims".
The statutes do not even speak of European countries and so the name perhaps should have been International Translations Centre instead of European Translations Centre, I.T.C. instead of E.T.C., an idea that has occurred to me several times in the last years, during the execution of my function of president.
In practice we have made already a step in that direction in accepting for instance Israel as a participant.
The United States of North America and Canada too, have been full members of the European Centre.
In an International Translations Centre unity might be more easy to realize. I should like to see this point discussed during the course of this symposium.

So much for the birds eye view of our wood, our E.T.C., its reasons for existence, its attidude towards information transfer, towards the language barrier and its possible solution, towards national and international politics.
We now want to examine the wood and its trees, its products and its inhabitants, its sunny places and its shadows more closely.

The functioning of E.T.C. is ruled by its statutes. From these statutes I will mention the following points, to which I shall add some explanation.

1. E.T.C. has its seat in the Netherlands, in the town of Delft (art. 1), where the Technological University Library offers housing and further accomodation.
The Dutch national organization S.M.T.W.L., (Foundation for scientific literature difficult of access) acts as the national host providing various facilities to E.T.C., channelling for instance the financial contribution by the Netherlands government, which amounts to 70% of the total yearly expenses of E.T.C. The remaining 30% has to be supplied by the other participants.
The Netherlands was chosen in 1960 from two applicants, the other being the United Kingdom, chiefly because this small country, not belonging to the big powers, would be neutral and not liable to political considerations, which could possibly effect the attitude of other countries.

2. Member of E.T.C. can be international and national institutions which can contribute towards the attainment of its aims (art. 4) and participate in its expenditures (art. 5, item 4). These participants have the right to vote when matters are brought before the Board.

The Board in its last meeting of October 1969 at Hanover in Germany, decided to introduce by way of an experiment (and therefore not yet laid down in the statutes) a second category of E.T.C.-participants, called associate members.
These members should of course subscribe to the general idea of E.T.C. and make their contribution in the form of translations or information on translations or cooperation in some other form, but they are not expected to make a financial contribution.
The associate members therefore do not have a voting right in the Board, but they may by paying the contribution, if they desire, change their status from associate into full member and thereby acquire voting right.

In the meantime a third category of participants came into consideration during the10th meeting of the executive committee of the Board, a category that might for example be called supporting members. What we want to do is to enlarge the circle of scientific and technological institutions who understand the aims of E.T.C. and who want to make their own contribution.
If these institutions are not "international and national institutions" in the sense of article 4 of the statutes, they have been up till now excluded from any form of support to E.T.C., which does not seem a right attitude on the part of E.T.C. and which certainly has a prejudicial effect on the financial position of E.T.C.
This question of the new categories of membership should be discussed during the course of this symposium.

3. E.T.C. has, as already mentioned, a Board (art. 7), an executive committee, normally called the Committee (not mentioned in the statutes, but just a practical arrangement), a chairman and vice-chairman (art. 7, item 2), a secretary-general (art. 8) and a treasurer (art. 9).

4. Furthermore, according to art. 12 of the statutes there is a E.T.C. staff, placed at E.T.C.'s disposal by the Dutch national organization S.M.T.W.L. This staff, called the Bureau, is headed by a director. The staff comprises 12 people divided as follows: Director, secretary, sales promotion and general affairs 2 , information service 1, processing department 6 , documentation 3, while accounts are handled by the NIDER (Netherlands Insitute for Documentation and Registration).

So far as to E.T.C.'s organization. At the moment there are 11 paying members, members with a vote on all E.T.C. matters.
These members represent the following countries: Denmark, Spain, France, United Kingdom, Israel, Luxemburg, Norway, the Netherlands, West-Germany, Sweden and Switzerland.
Associate members: Italy,Portugal,Austria, Canada and Belgium.
These associate members, though not having a voting right, take part in E.T.C.'s activities and are always fully informed.
There are of course no "supporting members" at the moment, as this symposium offers the first opportunity to discuss the desirability of creating such a category.

Proceeding with the counting of the trees in our forest, I might give you some figures about the amount of work handled by E.T.C. in the past ten years.
The acquisition and cataloguing section known as the processing department, is receiving some 24,000 titles annually.
These reach the Centre mainly through national centres and have their origin at hundreds of sources. The titles are meticulously verified and corrected when necessary before incorporation into E.T.C.'s catalogue.
Since the creation of the Centre ten years ago, E.T.C. has acquired information on about 300,000 bibliographical units. Almost the same number of translations is published in the journals translated cover-to-cover.
The Centre's collection consists of about 200,000 translations.
The annual growth is in the order of 20,000 items.
The information section handles some 800 - 1,000 requests a month and is now close to receiving the 100,000 request mark.

Furthermore it might be useful to summarize the various activities of the E.T.C. according to their nature:
1. First of all comes the collecting of data on translations made and of the translations themselves. Though E.T.C. does not have a complete collection of all translations it may say that it has a fairly complete knowledge of translations made. We should take into account that we are dealing with a free cooperation.
Not every industrial enterprise wants to send translations it has made to its national centre or to E.T.C. for use by others. It is even free to keep the presence of a translation secret if it feels that this is to the advantage of the enterprise. So for this reason the world will never know for 100% of the existence of all translations made.

2.The supplying of information on the existence of translations and if possible, the supplying of the available translations out of the collection of data and translations. This service is open to anyone, in any part of the world who can make a good use of it. Requests reach the Centre by letter, telephone or telex. They are handled without delay, copies of available translations are sent out within

24 - 48 hours. Applicants are given full credit and need not pay in advance. They can however open a deposit account if they like.

3. The third service is the publication of two bibliographies:
   a. The World Index of Scientific Translations.
      A general citation index published every three months which lists in alphabetical order of the original periodicals, the world production of scientific and technical translations.
   b. The List of Translations Notified to ETC.
      A twice monthly acquisition bulletin, listing according to broad subject groups individual translated articles with author and title. These titles have not previously been announced in national bulletins.

These publications we feel, are very important for several reasons:

i. To national centres, to libraries, to international enterprises or individual scientists and students, who subscribe to these bibliographies, calling E.T.C. is only necessary if they do not find the desired data in these periodicals.
   They are able to trace at home in their own Index and List any translation required, thus saving time and money. Only in the case when they do not find the title of the translation or they want a translation in another language than indicated or if they want to make sure that they have the last minute information (a translation may have come in at E.T.C. after publication of the latest issue of the Index or List) is it recommended that they apply to E.T.C. Thus E.T.C. feels satisfied that it has provided all interested parties with an up to date instrument which makes them to a certain extent independent.

ii. For a researcher, it is important and desirable that all bibliographical data in the world can be found in one place. Nothing is more frustrating than to have to refer to many sources. That is why E.T.C. wishes to gather all information in one publication.

iii. The World Index being produced by means of computer is able to bring out a cumulation of data published in preceding issues very easily and quickly. It is indeed quite simple to make cumulated bibliographies for any period desired by E.T.C.'s clients. If at the same time it is financially feasible then E.T.C. is always prepared to do so. Five-year indexes, ten-year indexes and so on have thus become possible.

4. The fourth service is the assistance to applicants to get a translation made. In this category mention should be made of the cooperation at the moment between E.T.C. and Euratom (Ispra). Dr. Perschke offers his services for the making of machine translations of articles from Russian into English.

E.T.C. also acts in bringing together clients and private translators. It has been done to the best of E.T.C.'s ability since the beginning though not in an organized way. It is of course impossible to guarantee the client that the translator, who's address is provided by E.T.C., will produce a good translation. It is the translator himself who must take full responsibility for his product. With national centres E.T.C. would like to set up a translators directory. E.T.C. collects under this project addresses of individual translators and translating bureaux, of national and

international translating organizations, of associations of translators, or of organizations who direct translating in a country or in a certain field of science and technology.
In short E.T.C. collects all available information on "who is willing to make a translation, in a certain field from a certain language into another desired language".
The service to users on information of this kind is free. We consider this as a matter of furthering the production of translations, which is one of E.T.C.'s general aims.

5. The fifth activity is a service to translators, from which of course applicants for translations benefit as well. It is one of E.T.C.'s activities to further the exchange of ideas and knowledge in the field of terminology, the production of lists of preferred terms, standardization and so forth. It does not mean that E.T.C. shall collect terms or prepare lists or dictionaries, or decide upon terms in any way. This work should be left completely to the many experts in this field. I will not enter into details now as these will be discussed tomorrow in the paper presented by M. P. Geleff. E.T.C. helps in contacting the widespread experts, in avoiding duplication of work, in setting up work in as yet unexploited fields and so on. E.T.C.'s director, Mr. G.A. Hamel, is active in the Council of Europe. He is a member of the ad hoc committee on terminology and prepared a report called "Analysis of the reactions received to the questionnaire distributed by the Council of Europe during 1969/1970 on the subject cooperation in the field of terminology".
It is this cooperation which E.T.C. also wishes to encourage and we are happy that we can make our contribution in the larger scope of the activities of the Council of Europe.

Summarizing E.T.C.'s activities and services:
1. Collecting translations and titles.
2. Supplying information from its collection.
3. Publishing the bibliographies "World Index" and "List of Translations".
4. Assistance in getting translations made.
5. Furthering cooperation in the field of terminology.

You will remember that I said in the beginning of this lecture that the language barrier is one of the obstacles that stands in the way of the so much desired flow of information transfer and we may feel happy that this language barrier is something that can be overcome. E.T.C.'s way of removing the language barrier is a practical one. E.T.C. neither attempts to create a world language, nor to try , by education, to improve the language ability of individuals, but hopes through its "5 services programme" to offer the basis for overcoming the present difficulties, called together the language barrier.

E.T.C.'s "5 services programme" to overcome the existing language barrier therefore is a programme we feel that deserves your full support. Much work has still to be done. New practical services, if you can suggest some, have to be added to the programme.
More countries than now already cooperating with E.T.C. are welcome.

E.T.C., the only international organization devoted to removing the language barrier in all its aspects, is a European organization, but it does not yet comprise all European countries, and it may develop from a European to a broader international organization through adoption by other continents as well.

Whatever we do in the future to realize our vision on the information and translation problem, let it be practical. Let me translate our high aims into very practical, day-by-day working procedures, resulting in very practical products: translations made and used. We invite everyone to join us on this trail.

Machine Translation

A provisional evaluation of an experimental Russian-English (MT) service in cooperation with the ETC (European Translations Centre) and other organizations

S. Perschke, CETIS

The Russian-English MT service was regularly established at the Ispra establishment of the CCR by 1965 after an experimental period and the improvement of the system from 1963-1965. Its primary purpose was to close an information gap existing, as many of the Soviet publications of interest for the scientists were not translated at all by the existing facilities (e.g. cover to cover translations) or arrived with too a long delay. In this case, MT appeared to be a fast and economic solution. The only handicap to be overcome was the translation quality which certainly is below the standard of a good man-made translation. The question to be answered was whether, at the actual state of the art, MT could fulfill a valuable function in scientific and technical information. A condition which was posed was that no human intervention was made on the computer output, because experience made in the U.S.A. had shown that post-editing, and re-composition of the computer output ~~cut~~ate-up all the advantages in cost and time which may offer the computer.
The conclusions of the experience can be summarized as follows:

a) Machine translation quality is below human translation, especially in respect to style, grammar, resolution of homographs and idioms, and graphic representation
b) Nevertheless, it may be a powerful information facility for certain applications and fields of science.

The general opinion was that the linguistic inadequacies, to a specialist in the subject field, did not prevent comprehension but working through a translation requested more time (up to twice as long), although experience and a certain assuefaction to the "style" progressively may speed-up reading.
At the present stage of development, in particular, due to the limited size and coverage of the machine dictionary, MT is satisfactory only

in a few subject fields, and in particular:

Chemistry,

Physics, especially nuclear physics

Engineering referred to the above points.

Attempts to translate texts from other subject fields are less satisfactory, since a good part of the specific terminology remains untranslated. (The letter could be overcome through an intensive lexicographic work)

As to the applications, it is obvious that the longer time requested for reading and the lower reliability of the translations, have the effect that their use is justified only if

- the number of readers is limited,
- the users are confident which the subject fields.

As it was stated in one of the comments received, it would be a nonsense to teach a large number of students with a machine-translated textbook. One of the objectives of the cooperation with organizations outside the C.C.R. was to verify the validity of these conclusions which had been made basing on a rather limited and homogeneous community. Before the cooperation with the ETC was established in 1968, single contacts were taken with several organizations and industries, like CERN, IAEA, ENEA, CEA (Saclay), Max Planck Gesellschaft, ZAED (Germany), MAN and some others, for whom some 40 Russian articles had been translated. However, except MAN, who made translate some 15 articles in the past 3 years, no continuous cooperation was established for various reasons, in particular, due to the distance and also to the difference of interests.
For instance, IAEA is interested in polished translations for publishing.
As for the reaction of the users, they did coincide with the experience made with the ETC, and will be discussed together.

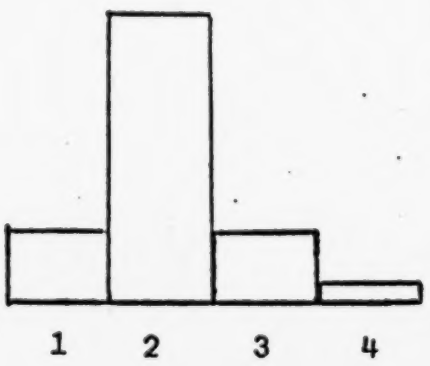
Cooperation with the ETC

The European Translations Centre, Delft, contacted CETIS in behalf of MT in summer 1967, with a visit of Dr. Hamel, Director, and Dr. van der Wolk, General Secretary. It was agreed that the ETC would offer its customers a machine translation, if there was no other translation available. In the first period, the translation would not be charged, but the users would be requested to give detailed comments on their impressions and the use made.

In the period from beginning 1968 to summer 1970 some 80 articles were translated, and received comments concerning some 40 of them. In the evaluation of the comments, purely technical details (as correction of mistranslated or untranslated words or expressions) were disregarded and each comment was examined concerning the following points.

1) How useful can MT be to a user
2) What are the more negative points
3) What should be improved with priority.

It was almost a general opinion (38 out of 43 comments) that the translations were ~~will~~ comprehensible to a specialist in the subject field with only little risk of misinterpretation. The remaining 5 comments stated that they could only come to a full comprehension after consulting a bi-lingual dictionary or a translator. And one of these 5 came to the conclusion that he could not reconstruct an experiment described by the article, but he conceded that, at least in part it was due not only to the translation, but also to the author. The results are summarized in the table below



1 : Completely clear 5 = 12%

2 : In general, clear to the specialist 33 = 77%

3 : Comprehensible to the specialist only after consulting a dictionary or translator 4 = 9%

4 : Not usable 1 = 2%

It should be noted that some of the less favourable judgements are due to articles outside the specific scope of the translation system (e.g. Agriculture).

The most important negative element of the comments is the fact that considerably more time was necessary to read through a machine translation in comparison to a good man-made translation. But this, as one could deduce from the same comments, was only in part due to the translation itself (untranslated words, errors of lexicography, grammar, word order, article insertion etc.). It seems that the principal reason for the slowing-down of reading is due to the characteristic presentation of the translation: the output is printed with an IBM 1403 printer with upper and lower case, but equations, formulae, tables etc. are not reproduced-

there is only blank space left to insert them, and the reader must consult the original. It seems that this presents more difficulties then we had expected. Especially if the reader has no notion of Russian at all, he finds it difficult to locate the formulae and graphics missing. This could be easily overcome, if CETIS disposed of a person (secretary level) who could insert the graphics in the translation.

Another criticism concerns the dictionary: especially if the text translated is somewhat outside the system coverage, one finds many untranslated or mistranslated subject key words. Unfortunately, CETIS does not dispose of ~~over~~ the personal necessary for an extensive lexicographic work.
At last, the poor linguistic basis of the system especially the absence of a syntax-oriented analysis and transfer is criticized. This is one of the most serious draw-backs of the system, but former studies lead to the conclusion, but the system design does not permit a gradual improvement of this point. The machine translation project which is being at present implemented at CETIS is based on advanced linguistic concepts which will hopefully produce better translations.

The experimental service of machine translation without charging is coming ~~going~~ to an end. An investigation made by ETC among its customers showed that a great majority of them is ready to pay for the service the actual cost ($ 7.00 per 1.000 words translated). At present, an agreement is being prepared with ETC.

Summary of the Co-operation with ETC

Starting date:	January 1968	
Translations made by summer 1970:	83	
Number of customers:	23	
Technische Informationsbibliothek Hannover		12
Public Research Institutes, BENELUX		10
Industries, BENELUX		42
Others and undefined		19
		83

As one may see, the location and the management of an organization have an important influence on the composition of the customers. The

large majority of the translations were requested in the area of Benelux and Germany. Only a few were located outside

United Kingdom	1
France	1
Sweden	2

Conclusion

The cooperation with ETC and other institutions outside the EAC clearly showed that at the present stage of development MT may fulfill a valuable function in scientific and technical information. But it is highly desirable to improve its quality and economy and to extend it to other languages, in order to ensure a better coverage and enlarge the scope of applications.

'STUDIESELSKAPET FOR NORSK INDUSTRI

E T C SYMPOSIUM
Luxembourg, 4-5 November 1970
EUROPEAN TRANSLATIONS CENTRE

THE TRANSFER OF INFORMATION TO THE USER

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> "The measure of success in information is in what the users do differently as a result of that information, – not simply in what we do differently in an attempt to get to the user".

Those words are found among the many valuable statements at the FID/II Symposium last year, and in a nutshell it presents to us the essential point in transfer of information: the users end of the information chain, – the user and his personal attitude towards information.

The problem is, however, that these users cannot be taken as a distinctly defined group of people. This concept: the user of information, covers actually the whole spectrum of different types of users ranging from the advanced scientist, – perhaps dreaming secretly of a future Nobel-prize, and down through all levels, to the average man in his daily work even on shop floor level.

Admittedly, in our strive for reaching these users, there is a strong temptation in concentrating our effort on advanced information systems aiming at the qualified users, highly receptive as they are to information, and therefore more easily responding to such advanced services.

However, taking the advancement of society as a whole into consideration, we must admit that such information systems should be capable of conveying information to all the rest of the users as well, and on all the different levels in the technological hierarchy.

Perhaps, therefore, it might be wise at this occasion to concentrate our discussions, – not on how we shall spend additional millions on improving our computerized information system for perfect selectivity and most complete recall, but rather on dissemination at the users end, with the many personal information barriers to be found there as most seriously limiting factors in the final utilization of information.

If, for a moment therefore, we consider external scientific and technical information as adequately available, – computerized or not –, but at least at hand to all those who positively ask for it, – we might then try to look more closely into the problem of the information flow within the firm, – and the final utilization of this information. We shall immediately find that this is where the numerous information barriers are found, hampering the flow of information, blocking the mutual exchange of information.

This internal communication for information can of course be substantially improved when in-house information units are set up within the firm or within the institute, for handling internal as well as external information and, mind you, for aggressively bringing information out directly to everybody concerned.

Such internal and in-house units for information services are, as a matter of fact, a must in modern industry, as only in that way can we hope to be able to set up an information system capable of serving as a receiver for information, and correctly tuned to the frequency of the many narrow-banded information transmitters as they exist in the form of external documentation services.

If now, through some of the hundreds of user-studies presently available, – we look more closely into what kind of information is needed within a firm, and who these users of information actually are, – we shall find that of all the information consumed within a certain firm, only a smaller part represents advanced information with relevance to that firm's own and specialized field of production. The rest, – and hence the greatest part of information needed, pertains to all the other daily problems involved when managing an industrial firm, and keeping a factory running efficiently.

And, mind you, to an astonishing degree this information is concentrated on what we could call an average technological level, and only to a lesser degree aiming at scientific and research level.

Informafobi, – this informafobe attitude so common among prospective users as a most natural act of selfdefence against the overwhelming flow of information, is one of the most serious obstacles encountered by all those who in any way are concerned with dissemination of information.

The essential point, therefore, is how and by what means shall we be able to change these informafobe users into informafil users strongly motivated for an effective utilization of all the knowledge acquired by mankind through research and development somewhere in the world.

A close relationship most certainly exists between this informafobi or informafili, – and the personality and individuality of the average users of information, with creativeness of the human mind as one of the most important factors in the utilization of information. And again, for this creativeness of the human mind we must distinguish clearly between on the one hand what the psychologist calls ability to "convergent thinking" with a judicial mind able to solve clearly defined problems, – and on the other hand "divergent thinking" which involves creation of new ideas and visions for new possibilities in research and development.

It goes without saying that for these two kinds of prospective users, there is indeed a need for quite different types of information. And what more is, this information must be presented in different forms and through ways and means adjusted to each type of user, in order to be able to appeal to him and make him motivated for a deeper penetration into the subject, and for an ultimate utilization of the information in his work.

For twenty years and more, we have been talking about "Mohammed and his mountain", as a constellation of actuality in technical information, – and indeed this has just as much actuality today. Can we expect the average user of information to "come to the mountain", or do we have actively to provide him with information suited for his needs, and adjusted to his particular pattern of behaviour ?

Can we therefore expect this average user to be able to take the initiative himself, thereby framing his own problem into clearly defined search questions, or should we rather prepare the information, – reasonably concentrated in order to avoid frustrating waste of time on searching among too much of irrelevant information, - in forms and ways which makes it easy for him to find what he needs ? Through browsing and what we could call "induced information" he might then be able to find most useful information even if he may not have been quite clear as to what kind of information he actually is in need for.

In this way the information is not merely brought within possible reach of a prospective user, but this user may even be made to realize that one particular piece of information has a message to him personally. With a system of this kind even the intellect and the creativity of each individual user is enhanced considerably.

Based on practical experience and experimental investigations, - and as a consequence of the distinction which must be made between informafobe and informafil users, - there are strong indications that only a few of the total number of potential users within a certain firm are actually capable of systematically utilizing presently available information tools as regular sources for information. The rest of the users to quite some extent have to rely on communication with colleagues in order to be kept sufficiently informed.

This is where the newly coined words "gate-keepers", "mediators" or simply "contacts" come into the picture, because only very few of the prospective users seem to be informafil enough, showing sufficient mental energy and motivation for a full effort in the utilization of available information tools, – to the benefit of even their informafobe colleagues. So, indeed the internal communication on a personal basis is of vital importance, not only for ascending and descending information following directly line-responsibilities within the organizational scheme, but perhaps just as much in the form of horizontal information through informal personal contacts. An essential point there is, however, that a responsibility chart showing clearly the distribution of information responsibilities is indispensable.

Analytical studies have on the other hand, and in spite of modern trends in management systems, revealed that several psychological and even social factors are forming barriers severely blocking such internal exchange of information through personal communication.

It might perhaps, therefore, be of interest to look for a moment at how the Japanese industry, with its fabulous industrial expansion, - has been able to solve its information problem. It seems actually as if there the group-mentality has penetrated the whole society with all its individual firms, in contrast to the pronounced individuality so common in Western countries. In Japanese industry the question is not what one particular person such as a certain NAKAMURA-SAN has observed, what the same NAKAMURA-SAN means, or what NAKAMURA-SAN proposes. On the contrary, it is always the group as such which, as a joint venture feels engaged in a problem with conclusive opinions on actions to be taken. This In the best sence of the word this allows for a free flow of information through internal communication. So, indeed, in this respect we have much to learn from our colleagues in the Far East.

And that brings us back again to external sources of information and the question of how information best should be made available to the individual user. Computerized information storage and retrieval, in spite of all the millions spent on systems development already, are still so much in its infancy when it comes to the dissemination side, and the direct contact at the users end, that it might perhaps be worth while to dwell for some minutes on what use we best could make of the output from this kind of databanks, - to use a word presently à la mode.

As we all know, - in documentation technique and computer systems tremendous advances have been made through the last years, and together with today's computer hardware we are presently in a position where we may consider the problem of storing and retrieving information through computerized systems, as practically solved.

Improvements can certainly still be made, although for quite some time we may have continued discussions as to whether "free-text" searching represents the right answer, or perhaps indexing, facetation and classification could be used for a greater advantage. Perhaps we might conclude that for certain purposes "free-text" searching may give sufficient precision and recall at reasonable costs, whereas for other purposes we cannot do without the mental effort on the input side through indexing, facetation and classification. But, of course, a combination of the two most certainly would provide us with the most efficient tool.

It is impressive indeed, what computerized documentation services like Chemical Abstracts, Medlars, Inspec, ISI/Asca, Engineering Index and others, with their magnetic tape services, have been able to achieve during the last few years, – as far as processing of information goes.

But when it comes to the dissemination side with actual utilization of information at users end, in direct contact with the individual and prospective user of information within the many thousands of industrial firms and research organizations, we are still in desperate need for more practical experience including the economic considerations. We may therefore still have a long way to go before we shall be able to integrate such computerized documentation services through magnetic tapes into the general pattern of the information flow within the individual firms.

We distinguish of course between current awareness services and retrospective searching, information discovery as compared to information recovery, which, as far as computer processing goes, are two distinctly different operations. Even with retrospective searching in computerized systems there is today hardly any serious technical problem involved, although improvements may still be made. Economically, however, the problem is far from being solved, in spite of most impressive achievements through systems like NASA, ESRO, EURATOM and MEDLARS, even supplemented with advanced techniques for display screens with push-button systems.

The crucial point is that even with all these facilities at hand, we can hardly sit back waiting for the user to "come to the mountain", - in other words, to pose his own clearly defined search question through available tape services. That kind of service, therefore, covers only a minor part of what all the users, prospective users included, really have of needs for information. All those of us, who actually have been trying to sell subscriptions to SDI-services, will have realized that this is in no way an easy-selling product.

It may perhaps at this point be of interest to look at some figures which recently have been found to be representative for the total costs involved in the regular use of magnetic tapes for SDI-services presently in operation within the Scandinavian countries.

With 300 profiles processed regularly, the actual costs for one such profile amount to 600 $ a year, when all expenses ranging from subscription to the tape, through the whole processing down to photocopies delivered on request from the library, are included. Although many of these costs of course are what we could call invisible costs, they nevertheless must be covered in some way or other, whether through governmental support or through payment from the user.

An interesting point is that expenses in the form of subscription fee for the tape amount to only some 4-5 per cent of the total 600 $. With such figures in mind, and considering that profiles of this kind necessarily are limited to rather specific search questions, we indeed may wonder whether at all it is possible to cover any substantial part of the need for information through such an SDI-service, even if that represents a most valuable service to the qualified user.

Today we see, as with Chemical Abstracts and Inspec to mention a few, two parallel services: magnetic tapes delivered regularly for processing on a computer as a basis for current awareness services, and printed abstract bulletins in the traditional form, to be read by the user.

However, such magnetic tape-services for current awareness, most valuable as they are in the daily work of any information center of some size, can hardly, and for reasons just mentioned, be expected to be operated regularly within the many thousands of industrial firms in need for information.

On the other hand, the tremendous increase in content, volume and price for the printed abstract bulletins has already proved to represent a nearly unsurmountable barrier for at least the medium-sized and smaller firms with their numerous users of information.

What we need, therefore, seems to be something in between these two extremes, – the tapes and the abstract bulletin, and in a way serving as discriminating filters for dissemination purposes at the user's end. At least they should be able to present to the user information from rather narrowly selected subject fields, and arranged in the form of easily browsable indexes, so that the user himself can easily seek out what might be relevant to his particular and momentary problem.

With information stored already on the computer, the production of such new means for dissemination of information, does not involve any technical problem, provided the information has been indexed and classified in an appropriate way.

In the general information work within science and technology we strongly need such new information tools, and let me add that translastions too, adequately processed on a computer with magnetic tapes and browsable micro-indexes as additional products on the output side, might fit well into our arsenal of such information tools.

The essential point in today's information work is to find and develop the right forms of output from our information systems to be used as the most efficient ways and means for dissemination purposes at the users end, and forms which easily can be adjusted to the many different types of users with their individual psychological behaviour.

Only with such tools at hand shall we ever be able to prevent the most regretable informafobi, and provide for informafil users highly motivated for an extensive use of the invaluable knowledge available through all the sources of information.

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E T C SYMPOSIUM
Luxembourg, 4-5 November 1970
European Translations Centre

ADDENDUM FROM DISCUSSIONS

Only some 40 per cent of the literature within the field of science and technology is available in the English language. In addition, and in spite of the fact that English presumably is a world language, English is not easily read everywhere.

With translations scattered all over the numerous different and often not so easily accessible places, we all agree that ETC has been doing, and will proceed doing, a most important work in collecting references to and copies from translations made already, to the benefit of all those who otherwise would have to make new and expensive translations themselves.

A key problem in this utilization of literature in difficult accessible languages, is, however, that even abstracts and indexes are not always available to the reader in a language which is easily read by him. As a result many expensive translations are today ordered, which later may prove to be of little or no relevance to the actual problem.

For that reason there is a great need for translations even of abstracts and indexes in order to make it possible for everybody concerned to choose the right original document to be translated.

With abstracts and indexes based on a formalized language – meta-language - , mechanical translation can today easily be made. As a matter of fact such mechanical translation of abstracts and indexes, based on standard sentences together with key-words, have been solved with special program in the POLYDOC-system of SNI. For the time being work is actually carried out as a joint Scandinavian venture for mechanical translation of abstracts and indexes within the field of Shipbuilding, whereas similar projects in other subject fields are still pending.

This system for mechanical translation of abstracts and indexes into whatever language wanted, could easily be used also for the information collected by ETC in the form of translated documents.

Together with a full computerization of the work within ETC, this translation system for metalanguages would actually provide for new and most valuable tools in the dissemination of information even from most difficult available languages.